Pablo Rio 2K

Product Guide

V2.0

Turnkey range and system specifications

Software description

Pablo Rio 2K

Pablo Rio 2K is a range of software high quality color and finishing systems running on standard PC hardware. The Pablo Rio 2K range delivers interactive realtime working for SD, HD, 2K and stereo3D projects. The comprehensive integrated toolset includes conform, color, editing, effects, text, paint and multi-format versioning enabling Pablo Rio 2K to complete a wide range of post production tasks. Pablo Rio 2K efficiently handles today's digital capture formats such as RED HDRx, Sony F65, SStP, ARRI, Canon and easily integrates Into data-centric post pipelines.

Pablo Rio 2K configuration choices

- Choice of storage from 500 mins to 50 hours HD
- Grading control surface - Neo, Neo Nano or no panel at all

Key Features

- Runs on commercial off the shelf (COTS) hardware
- Uses Nvidia K5000 GPU for great interactive performance
- Includes Edit, MLTFX, Effects (including Paint), Utilities and Scribe modules
- Real-time interactive operation on images up to 2K 16 bit
- Full stereo toolset includes geoFix for auto geometry fixing, autobalance for color matching of eyes, X/Y vergence and floating window controls

About this Guide

This guide provides comprehensive information on the capabilities of the Pablo Rio 2K turnkey systems specifications. It also details turnkey system options.

Please contact your account manager or mail marketing@quantel.com with any questions.

Pablo Rio 2K Turnkey System Specifications

Pablo Rio 2K turnkey systems provide guaranteed out-of-the-box performance. Pablo Rio turnkey systems are available in a wide range of configurations to allow customers to tailor the system to their specific needs. Pablo Rio Turnkey systems are supplied fully assembled, configured and tested by Quantel to provide the ultimate in performance and are supported by Quantel 24/7 worldwide.

Pablo Rio 2K Range – System Configurations

	Pablo Rio 2KO **500 minutes**	**Pablo Rio 2KO** **25 hours**
Video i/o	Quantel	Quantel
Quadro K5000	x1	x1
Video Storage	8 Disc Internal	24 Disc External
HD RGB 10bit @24fps	500 mins	25 hours
2K RGB 16bit @24fps	330 mins	15.5 hours
Real-time off disk playback*	1920x1080 @60P 2880x2160 @30P	1920x1080 @60P 2880x2160 @30P
Max Output Resolution	1920x1080 @60P 2048x1080 @25P	1920x1080 @60P 2048x1080 @25P

2k = 2048 x 1080

* Full real-time playback details on page 8/9

500-011 Pablo Rio 2KO 500 mins storage

Supermicro SuperWorkstation 7047A-73

Chassis - Supermicro CSE-743TQ-1200B-SQ
ATX 1200W PSU (80-Plus Platinum)
Supermicro X9DA7
2 x Xeon E5-2630 v2
- 2.6Ghz 6 Cores \ 12 Thread
- 256Kb L2 Cache - Per core
- 15Mb L3 Cache - Shared between all cores
- 4 Channel Memory Controller
- two 7.2 Gbps QPI links

32GB RAM (8x4GB) PC3-128000 REC ECC DDR3 DIMMs

1 x Nvidia Quadro K5000 – image processing and UI display

Mirrored System Drives
2 x 300GB, SAS 2.0, 15,000RPM configured as RAID-1 array (Seagate ST3300675SS)

Mirrored Audio Drives
2 x 600GB, SAS 2.0, 15,000RPM configured as RAID-1 array (Seagate ST3600057SS)

Video Workspace
1 x Supermicro 8 disk 2.5 to 5 1/4 mobile rack (M28E2)
8 x 900Gb, SAS 2.0, 10,000RPM configured as RAID-5 array (Hitachi HUC109090CSS600)
1 x LSI 9271-8i SAS2 RAID controller.

1 x DVD-RW Drive
7 x USB 2.0 ports
4 x USB 3.0 ports
2 x Firewire 1394A ports
2 x 1Gb Ethernet network ports
1 x 7.1 Soundcard

Supermicro mobile rack
Keyboard and mouse
Wacom Intuos 5 tablet and pen (as configuration options below

	No Panel	Neo Nano Panel	Neo Panel
Large Tablet	✓	x	x
Small Tablet	x	✓	x
No Tablet	x	x	✓

VTR Serial Interface

2x RS422 9-pin VTR serial interface ports are provided on the rear of the machine

Standard Video and Audio interfaces

2x multi-format 3G/HDSDI/SDI 10bit inputs with up to 16 channels of embedded audio

- Inputs auto sense any supported format

2x multi-format 3G/HDSDI/SDI 10bit outputs with up to 16 channels of embedded audio

- 2 Parallel outputs are available when operating in single link modes

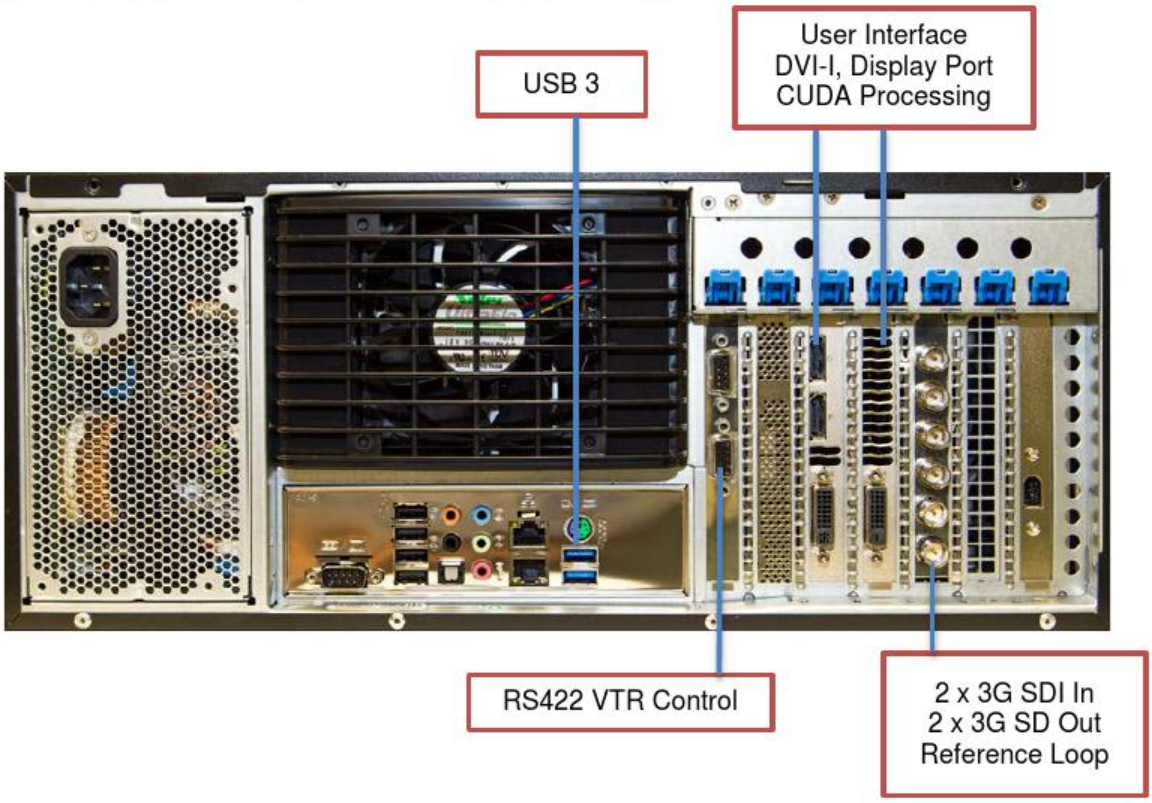
Supported Video input/output formats

Format Parameters				Video Interface Support		
Size	**Framerate**	**444/422**	**Stereo3D**	**Single Link SDI**	**Dual link SDI**	**3G**
SD	25, 29.97	422	No	✓	x	x
HD 720	50, 59.94, 60	422	Yes	✓	x	x
HD 1080	23.98, 24, 25, 29.97, 30	422	No	✓	x	x
			Yes	L+R	x	x
		444	No	x	✓	✓ Level B only
			Yes	x	x	L+R Level B only
HD 1080	50, 59.94, 60	422	No	x	x	✓ Level A only
2K	23.98, 24, 25	444	No	x	✓	✓ Level B only
			Yes	x	x	L+R Level B only

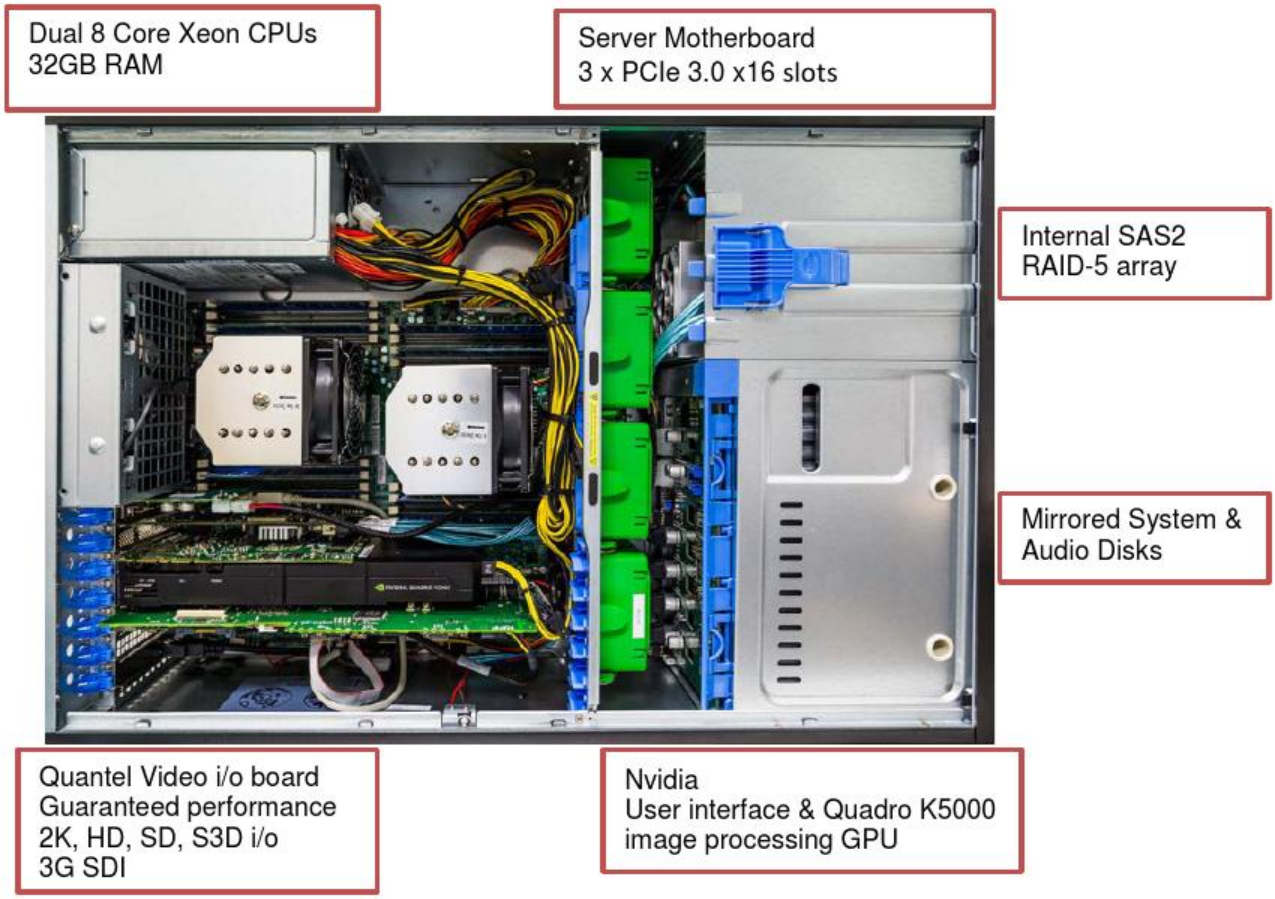
Notes

- 2K is 2048 x 1080 and is supported for output only
- 422 refers to Digital Component YCrCb, often called YUV
- 444 refers to 444 RGB
- Stereo 3D L+R is twin streams, one for L and one R

Pablo Rio 2KO with 500 mins Turnkey System Interfaces



Inside a Pablo Rio 2KO with 500 mins Turnkey System



500-010 Pablo Rio 2KO 25 hours storage

This Pablo Rio 2KO 25 hours storage has the same system specifications as the Pablo Rio 2KO with 500 mins storage except the internal video workspace and raid controller are replaced with:
1 x Adaptec 71685 SAS2 RAID controller
2 x SAS cables. (SFF-8644 to SFF-8088)
1 x External SAS array with 24 x 10,000rpm 900 GB Disks
Configured as Dual 10+2 parity disk arrays (RAID 60)

Motherboard Slot Utilisation

Available Slots	Pablo Rio 2KO 500 mins	Pablo Rio 2KO 25 hours
Back Panel Slot Only	RS422 VTR interface	RS422 VTR interface
PCI-E 3.0 x8	LSI RAID Controller	Adaptec RAID Controller
PCI-E 3.0 x16 (dual width)	Quadro K5000	Quadro K5000
PCI-E 3.0 x8	Covered	Covered
PCI-E 3.0 x16	Video i/o	Video i/o
PCI-E 3.0 x4 (x8 connector)	Spare	Spare
PCI-E 3.0 x16	Spare/Firewire	Spare/Firewire

- A Pablo Rio 2K system will only support a single GPU.
- The bottom back panel slot is used to breakout a Firewire 1394A port. This can be easily removed if the slot is required for other purposes.

User Interface and audio monitoring

- Monitoring is not supplied by Quantel as part of any Turnkey system.
- The user interface is optimised for 1920 x 1200, however it is also tested and will work at 1920 x 1080
- Audio is output as embedded audio on the HDSDI video outputs.

Performance

- Store any resolution on disk up to 8k x 8k
- Real-time playback of soft mounted files from 3rd party workspace.
  (Requires fast storage on a high bandwidth connection)
- 4K soft mounted RED files playback realtime using 1/2 med preview resolution
- The formats that can be played in real time from local workspace are shown in the chart on the following page

Real-time playback performance figures – MLT FX and Edit play with LUT on

Mono

Source Format		Frame rate (fps)				
Resolution	Bit Depth	24	25	30	50	60
1920x1080	10					
2048x1080	10					
	16					
2880x1620	10					
	16					
2880x2160	10					
	16					

Stereo 3D

Source Format		Frame rate (fps)		
Resolution	Bit Depth	24	25	30
1920x1080	10			
2048x1080	10			

All sources 444 color encoding GUI update during play turned off

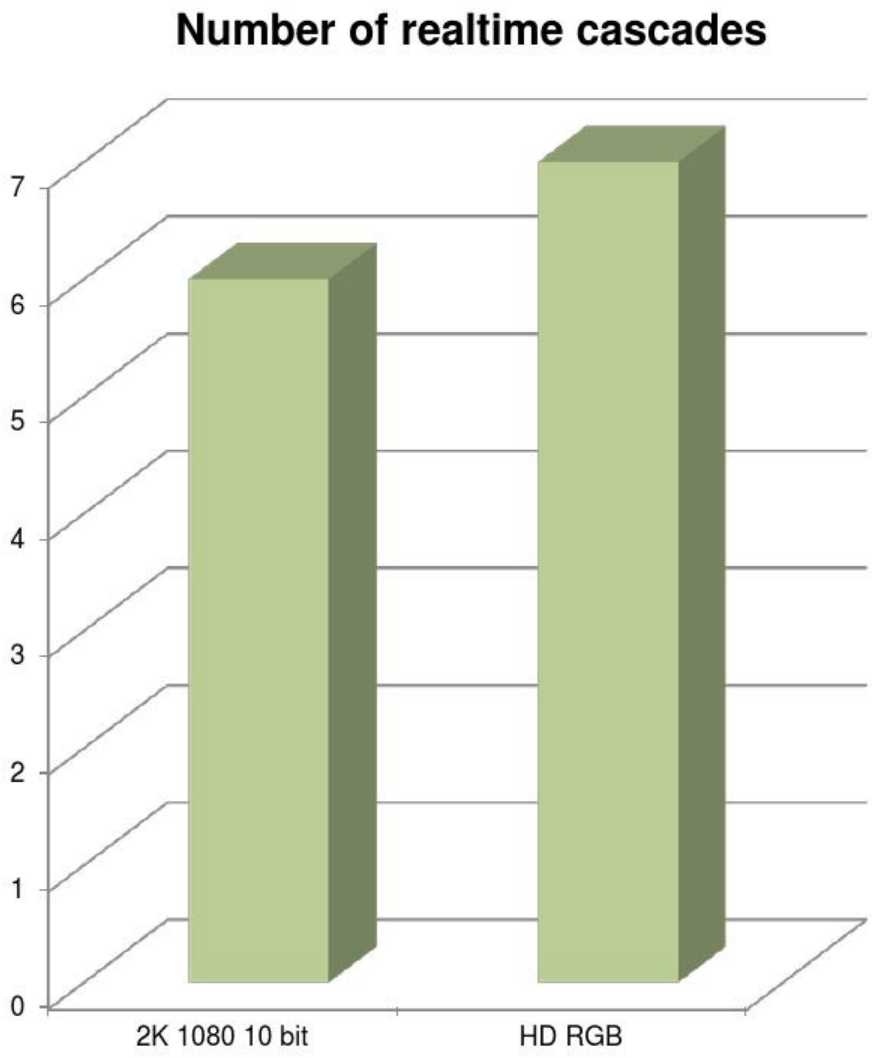
The output resolution used in the table is 1920x1080.
Output sizing is performed in the GPU so as other output resolutions/file formats are supported in future in the output hardware they can also be supported in the system.

Quadro K5000 GPU Real-time Effects Performance

An indication of the number of cascades that can be played back in real-time is shown in the chart below.

Level of real-time playback with number of colour cascades (more is better)

All cascades had a grade, most with soft shapes, several also with HSL keys.



Pablo Rio 2K Turnkey System Options

480-123 Neo Panel

The Neo Panel option for Pablo Rio provides the ultimate color correction environment. Faster and easier access to Pablo Rio's entire creative colour toolset without the need for complex menus.
Intuitive design allows any colorist to quickly migrate to the creative power of Pablo. Includes tablet and transport controls

480-223 Neo Nano Panel

Smaller footprint control surface
Has the majority of the Neo panel functions via a scrollable menu system
Comprehensive color correction in a small package

480-134 Intel 10Gb Ethernet card

Intel X520-SR1 single channel 10Gb ethernet adapter

500-143 Deliver to sQ

This allows any Pablo Rio to be connected to an Enterprise sQ Server system and deliver a clip in the server format no matter what the original resolution.
Requires sQ Server system and a QTube Transformer.

500-111 Additional Workspace for Pablo Rio 2KO 25 hours

Increase workspace by 25 hours.
The second array requires an additional back panel slot for two additional SAS connectors.
A maximum of two arrays can be connected.

Support policy for PC components

Customers are free to add PC components such as PCIe cards and disk drives not purchased from Quantel to their Pablo Rio Turnkey system. In general any Windows 7 64bit qualified device can be added. Quantel reserves the right to ask customers to remove such components when diagnosing issues. Quantel will not provide support on components not purchased through Quantel.

Software specification

The Pablo Rio 2K software is modular. Each module is accessed from the edit desk or via task bar at the bottom of the User interface.

Library

- Project-based or flat file library stores rushes, edits, packs, settings and clip metadata
- Fixed or floating library
- Technical metadata includes resolution, bit depth, scan, colorspace, pixel aspect ratio, reference black/white levels, source timecode, keycode, render state and many more
- User metadata includes project, originator, name, description and owner
- User defined clip colours in the library
- User defined library view including any or all fields in any order
- Fast search or sort on any field
- Unlimited user defined bins based on folders or search results
- Display entries as text, thumbnail or both
- Browse, scroll and play clips directly in the library
- Edit from library
- Nested folders for easy project organisation
- Define folder to store new material
- Modify clip attributes in the library
- Graphical indication of clip, rush, edit, stereo clip, clip with key or setting
- Graphical display of effects settings with thumbnail image
- Auto select of relevant settings, DVE, key, colour etc., when in MLTFX and Effects
- Drag settings directly from library onto any track in MLTFX
- Unique file ID prevents accidental overwrite
- FrameMagic™ allows instant and safe deletion of material to free up disk space without needing to consolidate
- Analyse Space – will show the percentage of local workspace any clip or folder will free up if deleted

Edit

- Multilayer Resolution Co-existence™ timeline
- Multilayer stereo timeline – layer and combine stereo tracks as if they were normal mono tracks
- Freely mix resolutions on the timeline without rendering
- Timeline, picture or storyboard editing with cuts, wipes, dissolves
- Gestural or keyboard based editing
- Matchframe for quickly finding the original source material from an edited clip, even with stretched clips
- Pan and scan on output
- Soft mount on timeline RED, DPX, TIFF, CIN, MXF-wrapped DNxHD, Sony F65, SStP, XAVC, Go Pro MP4, P2, Quicktime ProRes, ARRI RAW, Canon RAW, Cinema DNG and XDCAMHD formats
- Soft mounted RED media always has the decode live and adjustable on the timeline
- Soft mounted F65 media always has the decode live and adjustable on the timeline
- RED 48fps and HDRx supported
- Localise soft mounted media (if required) via the timeline, desktop or clips library

- Frame accurate editing at 23.98, 24, 25, 29.97,30, 47.95, 48, 50, 59.94, 60 fps with appropriate timecode
- View either source or destination timecode, or frame count
- Multi-level undo and redo
- Video and audio Fit to Fill editing
- Insert, replace and swap edit modes
- Visual and numeric single and multi-shot trimming
- Complex trim across multiple tracks and layers
- Extend edit to current position
- Segment highlights for easier identification and navigation
- Fully automatic management of tail frames with visible indication of tails and duration
- Automatic unlimited extend of repeated frames
- Audio video sync display with lock sync trim mode
- Industry standard keyboard shortcuts
- Linear or profile video speed changes in timeline or on Desktop
- Apply custom transitions designed in Effects Module that use any effect tool including plug-ins
- Uncommitted edits and transitions
- Multi-resolution commit of edits
- Flatten multilayer timelines with a top down view
- Segment out with or without tails
- Auto rebuild of transitions after trim or effects changes
- Auto rebuild of transitions for different aspect ratio version
- Split edits into their component rushes with or without tails
- Desktop scene detect
- Video Guide track offline comparison with split screen or mix display (both stereo and mono supported)

Audio Editing

- Multi-channel audio editing
- Mono, stereo or four audio channels per timeline track
- Audio waveform display (local workspace only) in with subframe accurate transitions editing
- Up to 16 channel audio input/output
- Digital or analogue style audio scrubbing
- Graphical insert and manipulation of crossfades
- Independent control of out and in fade duration and timing
- Track or segment level control with keyframing and dynamic rubber banding
- 3 band parametric eQ with graphical display
- Audio compression
- Live audio output during level, eQ or compression adjustment
- Flexible mix-down options including track assign and pan for playout
- Voice over record
- Audio loudness monitoring (requires the VisLM VST plugin from NUGEN)

MLTFX

- Pre-visualise multiple effects on a timeline
- Process effects include dve, color, keyer, blur, graphics, text and plugins
- Multiple layer blend modes including additive, subtractive, XOR and multiply
- Add multiple processes with gestural reordering where required

- High quality Quantel plug-ins – Anaglyph, Blend, Blur, Crash Zoom, Directional Blur, Dissolve, filters, Glass Tile, Kaleidoscope, Lens Flare, Magic Crystal, Mesh Warp, Mosaic, Nova, Ripple, Trail, Transition, Water Distortion, Wave, Whirl Pinch and Wind
- Over a thousand 3rd party plugins available
- In context grading across multi-layer timeline
- Colour effects include still store, storyboard, multiple cascade colour layers, ranges control, revolver, fettle, printer lights, HSL keyer, selective keyer, shape selectives, Inside/Outside grading and all are able to be driven via a mouse, pen, Neo or Neo Nano control surfaces
- Colour includes the ability to create and burn in 3D Cubes (LUTS)
- Effects grouping available for all modules
- Point and Mocha area based tracker, including stabilisation
- Stereo Tools including geoFix, geoFix2, keystone correction, autobalance, vergence and floating window controls
- Stereo material can be viewed in the UI in anaglyph, mono difference, mono anaglyph, chequerboard, flicker and half-mix modes. These modes are also available on the full frame output
- Hierarchy of segment, track, and clips effects including dve, key, colour, blur, text and plugins
- Timeline shows clips with effects history
- Real-time previews for reviewing changes
- Keyframes display for each segment locked to MLT zoom
- Keyframe Processes (simplify, densify, smooth, add noise, jitter, quantise, slide, de-extrapolate)
- Keyframe controller (constant, cycle, offset cycle, oscillate, directed)
- Flexible keyframe scaling when trimming
- Keyframes visible in tails
- Tails always available even in rendered history
- All dve numerical values are keyframeable, e.g. keyframeable soft-edged crops
- Text generation can be used as a key in blur and colour
- Enhanced gestural track/layer management
- Solo/Mute individual layers
- Add/Delete key via the timeline
- Background rendering. Either F1 auto render mode or via the render bin.
  (note that background renders may impact play performance)

Primary Color Correction

- Primary colour correction control of hue, saturation, lift, gamma and gain
- Master and individual channel controls
- S-Curve and pivot points for Master and separate R,G and B
- Stereo grading for individual or both eyes
- Separate differential controls for shadows, midtones and highlights
- Simple range (sim range) control where lift controls the shadows, gamma controls the midtones and gain controls the highlight regions
- All range controls (sim range, shadow, midtone and highlight) can be used in conjunction with one another and the master controls
- Hicon view of shadow, midtone and highlight areas
- Apply optional 3rd party plugins in creative grading sessions
- Red, Green, Blue and Density Printer Light controls with 0.25 point increments
- 9 editable fettle curves, working in RGB,YUV or HSL for complete colour control

- Colourpoint identifies image colours on graphs
- Cascade primary grades to simplify multi-shot grading
- Nullcast/balance for auto-colour balance
- Easy to use inside/outside grading operations
- Linear and logarithmic operation

Secondary Color Correction

- Unlimited cascaded secondary colour corrections
- Blend modes and opacity available on every cascade
- Plugins available on every cascade both inside and outside a key or a shape
- Revolver HSL-based secondary color corrector, multiple simultaneous 'in-picture' modifications (barrels)
- Select input hue and modify output hue, saturation and luminance.
- 12 Revolver presets
- HSL vector selective with RGB channel control of High, Low, High Softness and Low Softness for precise selection
- 10 Vector presets and user presets for HSL
- Blur, shrink and grow selective area
- Freehand or graphic shape selection with unlimited shapes per cascade
- Stereo disparity control for positioning shapes in 3D space
- Variable shape softness (Matinee) for inside and outside the shape
- Manually keyframe or apply tracks to animate shapes
- Mocha tracking - draw a shape and then track
- Group shapes for fast and easy animation
- Individual softness and group softness controls
- Sophisticated shape editing with rotate, scale, point tangents and tension
- Aperture - defocus or sharpen the selected image, key or shape area. Includes separate RGB channel control
- Independent cascade input and hole-cut selection for each cascade – derive key from any layer
- Name cascade layers for easy management
- Enable/disable individual cascades for quick before/after comparisons
- Common tools for primary and secondary grading

Grade Management

- Preview and transfer grades from shot to shot using Still Store, Storyboards or Settings Bin
- Auto-update of reel view when grade changes
- Unlimited reference frames with wipe and rotate split-screen comparison. Transfer grades from reference frames
- Enhanced Reference Frame and Storyboard display that shows both at the same time
- Powerful Group Grade in Effects allows shots to be graded via Originator, Source Timecode, selected Range or manual selection
- Save grades to Storyboard or library with thumbnail image
- Timeline indicator to show Storyboard range displayed
- Up to 6 extra Storyboards can be created and easily switched between and deleted
- Export grade settings with thumbnails to external pen drive or hard drive for easy transfer between systems
- Transfer all or partial settings

- Color Trim in Effects within a selected group. Actively Trim the entire group by the same amount
- Full transition handling with auto-rebuild of transitions after grade changes
- Easily store multiple versions of grades for reference comparison
- Adjustable Undo Interval in milliseconds

Stereo3D

- Stereo multilayer timeline
- Each stereo clip treated as a single clip item
- Timeline and library indictors for stereo clips
- Slip/slide left and right eyes separately on a segment by segment basis
- Swap eyes on a track or segment basis
- Stereo video guide track supported
- Easily view (solo) left and/or right eye on the main output
- Trim, edit and set transitions to both eyes as if a single item
- Stereo viewing modes include halfmix, mono difference, chequerboard, colour anaglyph, mono anaglyph and flicker modes
- Variable flicker rate and variable chequerboard size on output
- Stereo console for measurement of horizontal and vertical disparity in pixels
- Disparity and distance can be displayed as percentages of screen width
- Auto vergence controls. Tap anywhere on the screen to set zero disparity
- Auto geometry fixing tools with a choice of geofix or geofix2
- Vergence, floating window, rotate, push and keystone controls
- Auto color balance – match right to left, left to right or meet in the middle

Painting

- Paintbox™ on-board provides paint and graphics tools
- Paint on layers in their compositing context
- Variable density pressure sensitive brushes for real painting feel
- Pressure sensitive variable size brushes
- Air, chalk, paint and chair brushes
- Wash, shade, smudge, blur and spray functions work with all brush types
- Stencils for protecting areas from painting
- Create hi-con mattes from stencils
- Copy, restore and zip brushes for retouching flexibility
- Combine copy with stencil and smudge with stencil
- Restore from next, previous frame, clip, cut out or buffer
- Pasteup, unlimited cut outs with stencils
- Field or frame painting
- Floating colour palette for instant colour mixing
- Read image colour values in palette, illegal colour display
- HSL colour wheel in palette
- Colour Map
- Create and animate graphical shapes or hand-drawn shapes
- 2 and 4 colour gradients in graphical shapes
- Individual stroke or stroke sequence undo
- User definable grids for accurate alignment and templating
- Paint without swiping

Utilities

- Interlace, de-interlace
- Cinecompress/expand (remove or add 3:2 pulldown)
- Entangle, disentangle
- Freeze, Reverse, Flip and Average
- Separate and combine RGB

I/O and Conform

- Import any size up to 8K
- Store on local workspace any size up to 8K
- 16, 10 or 8 bit non-compressed native storage on disk
- Render on export – no need to render to local workspace to do deliverables
- Export any size up to 8K (8192 x 4320)
- Export of avi, cin, dpx, jpg, mov, mpg, mxf (includes DNxHD), SStP, XDCAM, P2, exr, png, sgi, tga, tif, tiff, vpb, wav, wma, wmv file formats
- Export stereo clips as separate eyes or in side by side mode in any of the above formats
- Support for soft mount of RED, DPX, TIFF, CIN, MXF-wrapped DNxHD, SStP, XAVC, GoPro MP4, P2, Quicktime ProRes, ARRI RAW, Canon RAW, Cinema DNG and XDCAM HD formats
- Resize on export, source size extraction and crops on export, burn in 3D luts on export (XYZ with suitable LUT)
- Choice of box or cut on export based on first frame of the sequence
- User defined Black/White levels on export
- User defined export menu settings (entire export menu snapshot) that can be saved and restored
- Export settings with thumbnail images to transfer to another Quantel system
- QXMLnet utilities allow access to and from Quantel workspace via a scriptable interface
- Direct import of single frames onto desktop with duration setting
- Publish AAF projects to audio post (ProTools) with essence, metadata and video reference file
- Add/Remove or Ignore of underscores from file sequences on import and export
- Export Naming can set an appended name or number to a file sequence (padding)
- Can use names and dots as separators and/or start sequences at any number
- Audio channel mapping control on input
- Autoconform multi-layer AAF files with cuts, dissolves, SMPTE wipes, M2 commands (freeze and varispeed), split edits and comments
- Conform of .stl subtitling files (after convert to aaf) to produce a text metadata track of subtitles
- Choice of stretch method when conforming
- Convert EDLs to AAF for conform
- Intelligent conform only loads material not already loaded
- Source offset for rippling source timecodes
- Multi-level conform priority control for quick handling of editorial changes with reference clip and reference project functions
- Automatic tracking of effects onto new conform via source or destination timecode tracking
- Conform from tape or file media on a network Auto search through network directory structure to find required media
- Filters for file format and resolution on data conforms

- Choice of rush naming conventions on data conforms
- Quick handling of editorial changes with reference clip and reference project metadata to maintain colour grading history during edit-list revisions
- Reference clip conform has option not to extend tails (rush/seg/dest tc options)
- Conform in “Source” or “Dest” load order
- Background conform from network
- View conform as edit list, track list or load order
- Build AAF and EDL of timeline
- Direct import of single frames onto desktop with duration setting
- Background import/export of file media via windows networking protocols.
- Batch import and export
- Compatible with SAN client software and FC HBA (not supplied)
- Conform settings for Arri, Canon, Cineform (raw wrapped avi and mov), F65, Quicktime, Phantom and r3d file formats
- AAF-based project import from FCP 7 via free Automatic Duck Pro Export plug-in with project data interchange including layer structure, transitions, dve, opacity and text
- Archive everything from complete project to individual shots or settings with full, new and minimum options
- Soft mount archive – archives can be viewed across a network and selectively restored.
- Archive can also be placed directly to the clips bin and timeline for editorial and effect changes

Titles

- Scribe software module adds rolls, crawls and lower thirds
- Caption compositor adds multiple titles onto timeline
- Mix text and graphics in rolls and crawls
- Anti-aliased render of international character set
- Use any Windows TrueType font
- Style control and character effects including edge colour, face, shadow, grading, softness, transparency and angle
- Tabs, margin alignment and safe area display for precise layout
- Place text on a spline curve
- Import text from txt or rtf files including tabs
- Import layouts prepared on QScribe standalone software
- Integrated Quantel colour palette
- Support for non-left to right, top to bottom languages

Effects

- The Effects module is provided primarily to support custom transition creation, access to Paint and for compatibility with existing Quantel archives. No development of Effects is planned, new capabilities will be added into the MLTFX module
- The Effects module does not support the Neo Nano panel